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Texting Versus Talking: Age, Sex, and Extroversion as Predictors of Frequency and Preference

Among an Undergraduate Cohort

A thesis

presented to

the faculty of the Department of Sociology and Anthropology

East Tennessee State University

In partial fulfillment

of the requirements for the degree

Master of Arts in Sociology

by

Chris LaBowe

May 2011

Dr. Paul Kamolnick, Chair

Dr. Scott Beck

Dr. Melissa Schrift

Keywords: texting, text messaging, voice call, cell phone, sms, communication

ABSTRACT

Texting Versus Talking: Age, Sex, and Extroversion as Predictors of Frequency and Preference

Among an Undergraduate Cohort

by

Chris LaBowe

This study examines text messaging behavior of ETSU undergraduates. Data come from a survey of 485 students enrolled during the 2010 fall semester. The current study explores the effects of sex, age, and extroversion on (1) the volume of texts a person sends and (2) preferences for texting or calling. The study also explores the use of cell phones as a means of avoiding others during co-present interaction. Findings reveal that age is the strongest predictor of text messaging, with younger respondents being more likely to text. The study also finds that women prefer texting, while men prefer voice calls. Age affects preference as well, with younger respondents preferring texting and older respondents preferring voice calls. The study also finds that women are much more likely to use cell phones to avoid others during co-present interaction.

ACKNOWLEDGEMENTS

First, I would like to thank my chair, Dr. Paul Kamolnick, for his tireless efforts in helping me edit the manuscript. More importantly, I would like to thank him for being a mentor and friend to me throughout my graduate career. I would especially like to thank Dr. Scott Beck. His willingness to share his profound knowledge has been inspirational to me. Finally, I would like to thank my family for their support throughout my life.

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CHAPTER 1

INTRODUCTION

With the cell phone's popularity increasing each year, research into this technology has proliferated. The explosive growth of text messaging has attracted great interest from researchers. Specifically, researchers are interested in why texting has become prolific. In some countries, for example, texting is now preferred to voice calls (Baron 2009). For American teens, texting is also preferred to voice calls (CTIA 2008; Lenhart et al. 2010). The present study examined texting versus talking among undergraduates at a regional university. In particular, this study examined potential predictor variables of texting such as sex, age, and extroversion.

Brief History of the Cell Phone

The origins of the mobile telephone go back to the late nineteenth century as an extension of radio communications. The use of radio waves for communication purposes dates back to the 1860s. Between 1866 and 1873, Dr. Mahlon Loomis, a dentist from Virginia, successfully transmitted electric discharges a distance of 18 miles between two mountaintops. Loomis discovered that these electric discharges could carry information if senders arranged the information into Morse code. Although Loomis received a patent for his work, for financial reasons, he never pursued it (Farley 2003). Loomis's work, however, was continued by other scientists. By the late 1880s, Heinrich Hertz, a German professor, delineated the process of how electromagnetic waves, which he called radio waves, travel through the atmosphere. After Hertz's discovery, various inventors began exploring how radio waves could be used for communication (Ling and Donner 2009).

Guglielmo Marconi laid the foundation for the development of radio communication. In 1894, Marconi began experimenting with methods of sending radio signals over long distances.

He succeeded, when, in 1901, he successfully sent radio signals across the Atlantic Ocean to the United States (Farley 2003). Nine years later, Marconi had so improved his radio system he sent a radio signal from the United Kingdom to Buenos Aires (Ling and Donner 2009). Thus, with Marconi, radio communication became a viable option (Farley 2003).

Radio communication continued to advance with the introduction of the vacuum tube. This invention allowed voice communication to occur over radio channels rather than just Morse code, thus allowing radio communication among police officers, fire fighters, fishermen, and the U.S. military (Ling and Donner 2009). As these examples show, mobile communication through radio initially focused on public rather than private use.

Alongside radio communication, the landline telephone grew in popularity. In existence since 1876, it began to slowly diffuse through the U.S. during the early part of the twentieth century; in 1900, there was one telephone subscription per 10,000 U.S. residents. By 1915, phone subscriptions increased to one per 1,000 U.S. residents. Though not yet ubiquitous, by the early part of the twentieth century, it had slowly gained a foothold (Ling and Donner 2009).

The merger of the landline telephone and radio communication eventually led to the mobile phone. AT&T and Southwestern Bell introduced the first radio-telephone service in St. Louis, Missouri in 1946 (Farley 2003). These mobile phones were huge by today's standards and consumed high levels of energy. Moreover, this new system functioned within a limited area. Further, the new system could handle only a limited number of subscribers, which constrained its use (Ling and Donner 2009). Prohibitive price also kept many people from purchasing mobile phones (Farley 2003).

The inventions of the transistor and integrated chip, along with the development of the cellular tower system for handling calls, provided technological means for the creation of a

contemporary mobile phone network. The transistor and integrated chip enabled mobile devices to become smaller and more energy efficient. The need to expand the range of mobile phones led developers to create the cellular system; instead of having one central tower, engineers decided that having many small towers in different locations would be more practical. With one central tower, mobile calls are dropped when a user goes out of range; in contrast, the cellular system allows the calls to be routed from tower to tower as a mobile phone user moves from area to area.

Although the basic technological platform was in place, the mobile phone did not gain popularity in the U.S. Regulatory problems, lack of uniform standards, the configuration of mobile handsets, and subscription problems hindered the growth of the cell phone in the U.S. (Farley 2003; Ling and Donner 2009). European countries, however, did a much better job solving these problems (Lacohee, Wakeford, and Pearson 2003). By the early part of the twenty-first century, U.S. developers had solved most of the previously mentioned logistical problems, so that by 2002, nearly 47 in 100 persons owned a mobile phone in the U.S (Ling 2004).

Text messaging is a mobile phone feature growing in popularity in nearly every country with mobile phone technology. Designing mobile phones that also permit the option of a short written messaging service, better known as “text messages,” emerged in Europe during the 1980s. European developers wanted to create a short messaging data service to augment the calling feature of mobile phones. At the time, ironically, texting was not viewed as integral to mobile phones but an ancillary feature that could attract more customers. Designers envisioned text messaging as a quick way to send a message to someone out on the job or to receive a notice from the phone company. Finn Trosby, considered the inventor of text messaging, compared the enormous popularity of text messaging to a fairy tale. “The story [of texting] has a slight

resemblance to those of the Norwegian fairy tale character Askeladden, who picks up all kinds of items that he encounters given the presumption that it may come to use some day. In the adventure, they always do, resulting in massive success (quoted in Goggin 2006, p. 71).” In fact, companies considered text messaging so unimportant that they did not charge for it. This fact made it very popular among younger users in Europe. Even when companies closed the loop hole, the price of texting was less than that of a voice call, resulting in its continued popularity in Europe (Longoria and Stark-Smith *N.d.*).

Literature Review

The ubiquity of cell phone use has led researchers to examine why so many persons have readily taken up mobile communication and how this communication has changed everyday life. In addition, researchers are also exploring how persons with various psychological temperaments use of the cell phone either through voice calls or text messaging.

Why do persons use cell phones? Studies in recent years have found that safety and security were important motives. In 1999, the EURESCOM P903 study, a qualitative study consisting of 36 focus groups from nine European countries, found that safety was a predominant motive. For example, 82 percent of the respondents reported that the cell phone was useful during an emergency. No other attitudinal indicator had such an extreme score in the study, revealing the importance of safety for cell phone users. A follow up study conducted in 2000 in Norway also showed the importance of safety as a motive for cell phone use. In this study, 56 percent of the respondents stated that the cell phone was most useful during an emergency situation. Interestingly, the study found that age was a robust predictor for whether respondents perceived the cell phone as a safety and security tool. Seventy-seven percent of the respondents over the age of 67 agreed with the statement that cell phones were the most helpful during an

emergency, whereas only 44 percent of respondents between the ages of 35 and 44 agreed with this statement (Ling 2004).

Other research has revealed the importance of safety for using a cell phone. In a study of U.S. teens, Lenhart et al. (2010) reported that 93 percent of teenagers ages 12 to 17 agreed that they felt safer with cell phones. However, the sex of the respondent also seemed important, with teenage girls in the study placing greater emphasis on describing the cell phone as a safety device. This same study revealed that safety concerns were the primary reason parents purchased a cell phone for their child: 98 percent of parents in the study identified safety as the reason for buying a cell phone for their child.

Other motivations than safety do, however, exist. For instance, the mobile phone has changed the way individuals coordinate their activities with family and friends (Campbell 2005). Ling and Donner (2007) found that before the diffusion of the mobile phone, individuals often called a certain location such as the home or office to reach a person. Persons thus had difficulty changing plans. The cell phone, by contrast, allowed one to be reached directly no matter the location, allowing finer means of synchronization. If an individual was in traffic, he or she could use the mobile phone to reschedule a rendezvous. In essence, time became more flexible since individuals could be contacted wherever they might be, allowing for schedule changes. The previously cited EURESCOM P903 study also confirmed the importance of the cell phone as a coordination tool. Around 92 percent of the respondents in the study agreed that cell phones were useful for informing the other party of one's delay, and approximately 75 percent of the respondents agreed with the notion that cell phones could be used to call ahead (Ling 2004). Lenhart et al. (2010) also found that around 87 percent of American teens aged 14 to 17 used

their cell phones for social coordination. Meanwhile, approximately 75 percent of the parents surveyed reported using their cell phones for coordinating their schedules.

Focus groups of teens in this study also revealed these same patterns. For example, one male focus group participant stated that he could not envision making plans without his cell phone. At the same time, however, teens in the focus groups also noted some of the trade-offs that accompanied social coordination via the mobile phone. Some teens, for instance, believed that the ability to change plans quickly resulted in less commitment to schedules. Nevertheless, the majority of the teens in the focus groups viewed the social coordination enabled by the cell phone as a blessing.

Negative effects have also been reported to accompany cell phone use among certain categories of users. Workers with families appeared to experience more stress. In a longitudinal study of 1,367 couples, Chesley (2005) found that cell phone use resulted in higher levels of distress and lower levels of family satisfaction, since persistent cell phone communication more readily enabled family issues to affect a person during work hours. Ling and Donner (2007) noted that cell phones have allowed work life to crowd out, compete with, and compromise a person's private life.

Cell phones have also affected interaction between divorced parents and their children. Ling and Donner (2007) cited a Norwegian study revealing that children from divorced homes received cell phones earlier than other children. In Ling and Donner's view, the cell phone benefited divorced couples and their children. They argued that the cell phone may reduce confrontations between ex-spouses by allowing a parent to call his or her children directly rather than indirectly via the ex-spouse.

Researchers have also noted the importance of cell phones as status symbols. Ling (2004) found that the type of phone a person owned acted as a status marker. For example, one respondent in his 20s stated that he could tell if a person was a businessman by the type of phone the person carried, and another respondent reported being proud of his particular type of cell phone. The use of the cell phone as a status symbol has been especially prevalent in cross-cultural studies. For instance, Varbanov (2002) found that Bulgarians of low social status often used cell phones as a way of increasing their standing in the eyes of others, noting that persons enjoyed talking loudly on their phones in public to get attention. These “new” cell phone owners hoped that this attention would gain them status. Fortunati (2002) also found that Italians viewed cell phones as status markers. The cell phone also appeared to be especially important as a status symbol among Norwegian teens. Using survey data from 2,979 high school students along with survey data collected from 120 self-selected teen boys and girls, Skog (2002) found a correlation between social class and cell phone use. Skog noted that teens from working class backgrounds had higher rates of mobile phone ownership than teens from higher social strata. However, this difference in mobile phone ownership was significant only for working class and upper class boys, not girls. The importance of cell phones as status symbols has also been found in the U.S. An online survey of 2,000 U.S. teens, for example, revealed that the cell phone ranked second only to clothes for determining a person’s social status (CTIA 2008).

As cell phone use has increased in the U.S. and in parts of Europe, analysts have started examining its impact on interpersonal etiquette. These studies of etiquette have focused on voice calls rather than text messaging. Commentators have noted three major areas where the cell phone has affected norms of etiquette. First, cell phone use in public places such as restaurants and theaters may lead to breaches in etiquette if the user speaks too loudly, thus

disturbing others. For example, nearly two-thirds of the respondents from a European-wide survey agreed with the statement that the cell phone disturbed people, with nonusers agreeing more strongly than users (Ling 2004). A study of 383 U.S. college students found that the majority of respondents believed it was inappropriate to use cell phones in some public areas such as theaters and libraries (Lipscomb et al. 2007). Cell phones may also alter or interrupt physical co-present interaction with another person. When a person decides to take the call and suspend his or her interaction, it may be considered impolite and rude. Finally, Ling (2004) found that some people felt uncomfortable hearing another person's call.

Studies have also highlighted the differences in perception of cell phone users and non-users. Ling (2004) found that persons who did not use cell phones appeared more likely to view cell phones as a nuisance. However, this view may change when a person starts using a cell phone. Palen, Salzman, and Youngs (2000) noted this trend in a study of the behavioral changes in 19 persons subsequent to adopting the cell phone in their daily lives. Nearly all of the subjects initially held negative views about cell phones; however, afterwards, the subjects began to temper their views. All but one subject, in fact, changed their perceptions from negative to positive. Moreover, several subjects did not even care how others perceived their use of cell phones in public.

The explosive growth of text messaging has captured the research community. In some countries texting has actually replaced voice calls as the preferred method of cell phone communication; for example, more Japanese mobile users preferred texting to talking (Baron and Ling 2007). The popularity of text messaging has also led researchers to compare it directly to voice calls in order to examine the usage differences between the two methods of communication.

Baron and Ling (2007) provided one of the most descriptive studies exploring both the frequency of talking and texting and the reasons behind the usage of both mediums. Their study of 93 college undergraduates from two U.S. universities found that talking was more prevalent than texting. For example, of the last 10 mobile communications sent or received from respondents at the two universities, only 27 percent were texts. Despite this disparity, nearly all of the respondents used texting: 91 percent of respondents from university one and 96 percent of respondents from university two used text messaging. They also examined to whom students most often texted or called. Respondents at both universities directed most of their calls to same-age friends, with nearly 60 percent of the last 10 calls going to this category. Parents were the next most frequently called, with around 22 percent of calls at the first university and 17 percent of calls at the second university going to parents. Moreover, students from each university were more likely to text their friends than other categories. Students from university one sent 76 percent of their texts to friends, while students from university two sent 54 percent of their texts to friends. Siblings were the second most frequently texted from university one, and the category of “other” received the second most texts from the second university in the study.

Baron and Ling (2007) also examined reasons why respondents preferred voice calls to texting. For both universities, voice calling was preferred for keeping in touch and also for making arrangements to meet. Making arrangements was also a major reason for sending text messages. Why might a person choose to text rather than make a voice call? The researchers found that a majority of respondents cited the fact that it was an inconvenient time for them to talk as their primary reason for texting. A desire for brevity and better timing were the next most frequently cited reasons. Finally, the researchers examined if respondents had ever pretended to talk on their phones and the reasons behind this behavior. Approximately 35 percent of the

respondents at university one admitted such pretense, while 68 percent at the second university admitted to this behavior. For females at each university, being out alone at night was the primary reason for feigning cell phone use, followed by the desire to avoid someone. Although this study explored several areas of cell phone use, it had two major weaknesses. Limitations of this study included the use of a small convenience sample and the absence of male respondents at the second university.

Baron (2009), in a recent cross-cultural study of 2,001 university students aged 18 to 24 from Sweden, the U.S., Japan, Italy, and South Korea, compared the frequency of voice calls to text messages. She found Japanese, Korean, and Italian students send more text messages than students from Sweden and America. In fact, around 81 percent of Korean students sent more than 11 text messages the day prior to the study, compared to just 32 percent of American students. Meanwhile, nearly 44 percent of Korean students sent 30 or more texts the previous day, while only 11 percent of U.S. students did so.

Although texting rates in the U.S. have not eclipsed the texting rates of some European countries, this trend may be changing. Lenhart et al. (2010) found that U.S. teens now text more frequently. Data came from a survey of 800 U.S. teens aged 12 to 17 and nine focus groups with teens aged 12 to 18. This study revealed that between 2008 and 2009 teens who said they texted rose from 38 percent to 54 percent, a remarkable 42 percent increase in only one year. Moreover, half of all teens in the survey reported sending 50 texts a day, and nearly 15 percent reported sending 200 texts a day.

The study also highlighted differences between males and females with regard to texting. Girls typically sent and received approximately 80 messages versus boys who sent and received approximately 30 texts per day. Girls were also more likely than boys to send messages to

friends. Around 84 percent of girls said they exchanged long text messages dealing with personal matters, while only 67 percent of boys did the same. With regard to voice calls, teens in the survey averaged approximately five calls per day and cited voice calls as being important for connecting with their parents. Again, the study revealed differences between teen boys and girls. For example, approximately 59 percent of girls used their cell phones to call friends each day compared to 42 percent of boys. Prior research from the U.K. and other European countries has also found that females send more texts than males send (Crystal 2008; Faulkner and Culwin 2005).

Psychological variables may also influence a person's preference for texting rather than talking. Reid and Reid (2007), using the Leary Social Anxiousness scale and the UCLA Loneliness scale, found that lonelier participants preferred voice calls to text messaging, while socially anxious participants preferred texting. Data came from an internet survey of 158 participants aged 16 to 55 from the U.K and the U.S. The study revealed a weak negative correlation between texting and loneliness ($r = -.18, p < 0.05$). The study also demonstrated that socially anxious participants preferred texting to talking, although the researchers admitted that the correlation was weak and non-significant ($r = .12$). Nevertheless, the t test contrasts revealed significant differences between the groups, $t(155) = -3.83, p < 0.01$. In fact, all of the t tests showed significant differences between anxious and lonely participants in terms of texting and voice calls. The researchers thus believed that psychological temperament may be a mediating factor with texting and talking. These findings were consistent with other research that has noted significant differences between people who text and those who prefer talking (Reid and Reid 2004; Rettie 2007). Nevertheless, one study of college students found that loneliness did not lead

to a preference for texting (Jin and Park 2010). Consequently, additional research needs to be done examining how psychological variables interact with preferences for texting and talking.

Researchers have also examined other factors that may lead to a preference for texting over talking. Ceccucci, Peslak, and Sendall (2010) found that a person's attitude toward texting, compatibility of texting with existing values, ease of use, and visibility were all significant predictors of texting. Data came from a sample of 153 students and faculty members at two northeastern universities. The study revealed that visibility proved the most significant predictor of texting. This variable had a standardized coefficient of .381. The researchers hypothesized that seeing other individuals text may influence a person to do the same. Attitude toward the technology was also significant with a standardized coefficient of .351. Ease of use and compatibility were the next strongest predictors of texting, with standardized coefficients of .271 and .255. The results were significant at the $p < .05$ level. These findings were consistent with another recent study using similar variables as predictors of text messaging (Ceccucci, Peslak, and Sendall 2010a).

Taylor and Harper (2003) provided one of the more unique explanations of why people text. The researchers speculated that texting was a form of gift giving, with texts being offered as gifts to friends and others. Using field observation and participant interviews, the researchers found that some respondents refused to delete texts from friends and significant others because of the value they had. When asked why they did not transfer the message to another medium such as paper, the respondents said that the messages somehow lost their value during the transfer. Taylor and Harper also noted that when a person did not respond to a text message, he or she breached texting etiquette. If one person texted a friend, the friend was supposed to text

back in a timely manner or risk breaching etiquette. The researchers thus viewed texting behaviors and texting etiquette as analogous to gifting.

The researchers also found that text messaging was very important for keeping romantic relationships intact. One respondent noted that his wife expected him to text her several times a day. When prodded what would happen if he did not text, the respondent said that it may cause relationship problems with his spouse. For some individuals, texting also appeared important for maintaining friendships. One respondent, for example, reported feeling depressed when she did not receive texts from a friend during the day.

Other facets of texting have also been studied. For example, researchers have recently started examining the grammatical structure of text messages (Crystal 2008; Ling and Baron 2007), the use of text messaging to harass others (Short and McMurray 2009), and the impact of texting on driving behavior (Madden and Lenhart 2009). If texting continues to grow as a medium, studies on its facets will proliferate. The same can be said of the cell phone in general. Goggin (2006), for example, argued that improvements in technology will add new facets to the cell phone. Hence, texting may at some point be replaced by another form of communication.

The current study was an extension of prior studies examining texting. Although previous research has examined sex and age, very few have examined the effects of these variables on undergraduate texting frequency and preference using a logistic regression model. Moreover, prior research has not examined the effects of extroversion on frequency and preference among undergraduates. Finally, to add to the findings reported by Baron and Ling (2007), this study explored how sex, age, and extroversion affected the dependent variable of pretending to talk on a cell phone to avoid someone.

Operationalization of Variables

As previously mentioned, the independent variables in the study consisted of sex, age, and a variable measuring extroversion. In the study, males were coded 1 and females 0. The age variable was scaled and measured the respondent's age in years. The mean age of students in this study was 21.18 years with a standard deviation of 4.7. To examine if a respondent had an extroverted personality, questions derived from the NEO-Five Factor Inventory (FFI) were used. The NEO-FFI scale consists of 60 questions designed to measure five factors of personality: neuroticism, extroversion, agreeableness, openness, and conscientiousness (Costa and McCrae 1992). Through factor analysis, the NEO-FFI has proven reliable for measuring the correlation of these traits in individuals (Srivastava 2011). Students in this study responded to four questions measuring extroversion. The NEO-FFI divides extroversion into three categories: positive affect, sociability, and activity. For the present study, students answered questions measuring the sociability aspect of extroversion (See question 8 in survey for these items). The extroversion scale for sociability has a range of 1 to 20, with higher scores indicating increased extroversion. Undergraduates in the study averaged 13.63 on the scale with a standard deviation of 2.9.

The variable quantifying texting frequency was trichotomous: 0 to 99 messages, 100 to 199 messages, and 200 or more messages. The variable examining preference for texting or voice calls was divided into three categories. Respondents could choose (1) texting, (2) talking, or (3) having no preference. Finally, respondents were asked if they had ever pretended to talk on their cell phones to avoid someone. This question was dichotomous: yes or no.

Hypotheses

Three independent variables—sex, age, and extroversion—and three dependent variables—texting frequency, preference for texting or talking, and use of the cell phone to avoid

others—were examined in this study. For sex, it was hypothesized that females would send more texts than males would send (H1a), prefer texting over talking (H1b), and be more likely than males to feign talking on their phones to avoid someone (H1c). This hypothesis was based on the research of Baron and Ling (2007) who found that females were much more likely than males to feign cell phone use to avoid others.

A second set of hypotheses explored the effects of age on these dependent variables. It was hypothesized that younger respondents would send more texts than older respondents would send (H2a) and be more likely to prefer texting to voice calls (H2b). The effect of age on using a cell phone to avoid someone was also tested. It was predicted that younger respondents would be more likely to feign using their cell phones to avoid someone (H2c).

Extroversion was the final independent variable examined in this study. It was hypothesized that more extroverted participants would send more texts (H3a) and would be more likely to prefer texting (H3b). It was hypothesized that extroversion affected whether a person had feigned talking on his or her mobile phone to avoid others, with less extroverted participants being more likely to use their phones for avoiding others (H3c).

CHAPTER 2

METHODS

Research Method and Sampling Strategy

Data were collected using an online survey administered to currently-enrolled students at a regional Southern university. The survey consisted of items measuring a broad range of cell phone behaviors and attitudes. Questions measured texting frequency, motivations for texting and voice calling, preferences for texting or voice calls, and extroversion as well as demographic variables. A convenience sampling design was employed for data collection.

Subjects and Collection Method

Students enrolled during the fall semester of 2010 were sampled. The study used data only from undergraduate respondents. A total of 500 students took the survey; however, 15 non-undergraduate respondents were removed from analysis, leaving a total of 485. Thus, this study consisted of information collected on 485 undergraduate respondents. Of these, around 75.9 percent (365) were female and 24.1 percent (116) were male. Four respondents declined to answer this question. Nevertheless, the study over-sampled females.

Data derived from students of all class ranks. Approximately 43 percent of respondents were freshman, while sophomores, juniors, and seniors made up a combined 57 percent of the sample. In terms of age, 87.4 percent of respondents were between 17 and 24 years of age, while 12.6 percent were 25 years or older. A majority of the sample was white non-Hispanic (83.2 percent). African Americans made up 8.1 percent of the sample, while Asians, Hispanics, and a category of “other” made up 8.7 percent combined. Two respondents declined to answer this question, however.

To collect the self-reported data on cell phone behaviors and attitudes, the SONA website was used. The SONA website is an online survey forum designed by SONA Systems and administered by this Southern university's psychology department. Students enrolled in introductory psychology courses at this university are often required to take a number of surveys on the site as part of their final grade or for extra credit. However, other departments also use the SONA site for their classes. Students enrolled in classes that use SONA are assigned an identification number. At the end of the semester, the system sends an email to each instructor telling him or her how many surveys each student has completed. Unlike instructors, researchers who put their surveys on the SONA site have access only to a student's identification number rather than his or her name, thus protecting each student's anonymity. Surveys on the SONA site are analogous to paper surveys. Students, for example, can answer open ended questions as well as close-ended questions in exactly the same fashion as a paper survey. The site also allows students to quit participating in a survey at any time. Further, students have the option to decline answering particular questions if they so choose. The survey used for this study was administered to students via the SONA website during the fall 2010 semester. The survey consisted of 51 questions measuring various cell phone attitudes and behaviors, with the bulk of questions focusing on texting and voice calls (see Appendix for survey).

Statistics and Data Analysis

To test hypotheses, the study used two forms of logistic regression. Because texting frequency and preferences for texting or talking had more than two categories, the study used multinomial logistic regression for these variables. This type of regression allows predictions to be made for dependent variables with more than two response categories. However, multinomial regression does not involve assumptions of ordinality. The "pretending to talk on the cell phone"

variable had only two categories, thus binary logistic regression was used for analysis. The logistic regression model is expressed as $\ln(P_1) = \alpha + \beta_i X_i$, where $\ln(P_1)$ is the logged odds that the dependent variable is 1 as opposed to 0, α is a constant term in the regression model, β_i is a vector of coefficients representing the effect of each predictor on the dependent variable, and X_i is the corresponding vector of values of the independent variable. All of the independent variables were included together in the models rather than being placed in separately. Thus, the models revealed the net effects of the independent variables on the dependent variables. To better analyze the data, two models were used for each dependent variable. The first model for each dependent variable used weighted data, while the second model for each variable used non-weighted data. A weight variable was used because of the preponderance of females in the study. Females constituted nearly 76 percent of the respondents in the study, while in the actual student body population females made up 57 percent. To make the data analogous to the student body population, females were weighted down by a value of .746, while males were given a weight of 1.8.

CHAPTER 3

FINDINGS

General Characteristics of Cell Phone Use Among Undergraduates

The survey revealed the ubiquity of cell phone use among undergraduates, with 482 respondents (99.4 percent) reporting cell phone use, and 449 respondents (92.8 percent) reporting the cell phone as their primary communication device. As noted in table 1, concomitant to the upsurge in cell phone use, use of landline phones has declined among undergraduates, with 287 respondents (59.2 percent) reporting that they do not have landline telephones. Four hundred sixty-six undergraduates (96.5 percent) reported generally keeping their cell phones turned on, and 460 respondents (95 percent) generally kept their cell phones within reach. The responses showed the popularity of text messaging among undergraduates. As can be seen in table 1, in terms of text messaging, 479 respondents (99 percent) reported having this function on their phones, while 477 respondents (99 percent) used their phones for texting. Unlimited texting plans also appeared common among sample respondents, with 439 (91.3 percent) stating they had unlimited texting plans. Table 2 shows that in terms of texting frequency, 284 respondents (59 percent) said they send an average of between 0 and 99 messages per day; however, 126 respondents (26.2 percent) said they send between 100 and 199 messages per day. Only 71 respondents (14.8 percent) said they send and receive 200 or more texts per day. These findings clearly highlight the importance of the cell phone to the lives of these respondents; these findings also indicate the importance of text messaging for undergraduates.

Table 1 General Information on Undergraduate Cell Phone Use

	Yes (frequency)	No (frequency)
Do you use a cell phone?	99.4% (482)	0.6% (3)
Is the cell phone your primary device of communication?	92.8% (449)	7.2% (35)
Do you have a landline phone?	40.8% (198)	59.2% (287)
Do you generally keep your cell phone turned on?	96.5% (466)	3.5% (17)
Do you generally keep your phone within reach?	95% (460)	5% (24)
Do you have text messaging on your phone?	99% (479)	1% (5)
Do you use your phone for text messaging?	99% (477)	1% (5)
Do you have unlimited texting on your phone?	91.3% (439)	8.7% (42)

Note: Because of non-response on several questions, not all row frequencies sum to 485.

Table 2 Quantity of Texts Sent and Received

	Average texts sent daily (frequency)	Average texts received daily (frequency)
0-99 messages	59.0% (284)	59.7% (287)
100-199 messages	26.2% (126)	25.4% (122)
200 or more messages	14.8% (71)	15.0% (72)

Note: Because of non-response on several questions, not all column frequencies sum to 485.

Whom Are Respondents Texting and Voice Calling?

The survey also asked respondents whom they texted the most and those frequencies are summarized in table 3. Around 60 percent (289) said they texted their friends very frequently compared to other categories. The next most frequently texted group was the “others” category. Twenty-six percent of respondents (118) very frequently texted “others,” while 15.1 percent (69) texted siblings very frequently. Approximately eight percent (37) and five percent (15) texted their parents or child very frequently.

Table 3 People Respondents Text the Most

	Text very frequently (frequency)	Text frequently (frequency)	Occasionally text (frequency)	Sometimes text (frequency)	Never text (frequency)
Parents	7.7% (37)	20.8% (100)	33.3% (160)	21.6% (104)	16.6% (80)
Child	4.7% (15)	4.0% (13)	5.6% (18)	6.2% (20)	79.4% (255)
Friends	60% (289)	23.4% (113)	11.8% (57)	3.9% (19)	0.8% (4)
Siblings	15.1% (69)	21.0% (96)	30.9% (141)	18.2% (83)	14.9% (68)
Others	26.0% (118)	16.6% (75)	28.0% (127)	18.5% (84)	10.8% (49)

Note: Because of non-response on several questions, not all row frequencies sum to 485.

When asked how often they voice call friends, around 34 percent of respondents (164) stated they called their friends frequently or very frequently. By contrast, as shown in table 4, nearly 70 percent respondents (339) frequently or very frequently called their parents. Parents were thus the most likely category to receive voice calls from participants. Table 4 summarizes these results.

Table 4 People Respondents Call the Most

	Call very frequently (frequency)	Call frequently (frequency)	Occasionally call (frequency)	Sometimes call (frequency)	Never call (frequency)
Parents	33.7% (163)	36.4% (176)	17.8% (86)	8.3% (40)	3.9% (19)
Child	3.5% (11)	6.4% (20)	9.3% (29)	6.7% (21)	74.1% (232)
Friends	10.6% (51)	23.5% (113)	39.7% (191)	23.7% (114)	2.5% (12)
Siblings	9.0% (41)	15.8% (72)	32.4% (148)	26.5% (121)	16.4% (75)
Others	12.8% (58)	17.4% (79)	31.6% (143)	26.0% (118)	12.1% (55)

Note: Because of non-response on several questions, not all row frequencies sum to 485.

Reasons for Texting and Voice Calling

The survey also examined reasons for texting rather than voice calling. Table 5 reveals that restrictions on the respondent's and recipient's ability to engage in a call at the particular time of the communication were the two top reasons for texting rather than talking, with approximately 80 percent of respondents (385, 396) citing these as either somewhat important or very important. For instance, the respondent or recipient may be in a place where voice communication would be disruptive, promoting the use of texting rather than calling. Respondents also said that some messages were better delivered through texting, with 72 percent of respondents (345) considering this as important. Similarly, around 70 percent of respondents (335) cited wanting to keep the message short being an important reason for texting rather than calling. Interestingly, the lower price of text messaging did not appear to be an important reason

for using this medium over talking. Some respondents cited keeping distance from the recipient as an important reason for texting, although the percentage was low. For example, around 37 percent of students cited distance as an important reason for texting. Texting thus allows some respondents an escape from confronting recipients via voice calls.

Table 5 Reasons for Texting Rather Than Calling

	Very important (frequency)	Somewhat important (frequency)	Not very important (frequency)	Not important at all (frequency)
Not a good time for caller to talk	33.8% (162)	46.5% (223)	16.0% (77)	3.8% (18)
Not a good time for the recipient to talk	32.2% (155)	50.1% (241)	15.0% (72)	2.7% (13)
Wants to keep the message short	32.2% (155)	37.4% (180)	21.6% (104)	8.7% (42)
Particular communication is better done through texting	28.7% (138)	43.0% (207)	20.2% (97)	8.1% (39)
Texting is cheaper	14.0% (67)	14.3% (68)	22.6% (108)	49.1% (234)
Wants to keep some distance from the recipient	8.4% (40)	28.7% (137)	30.8% (147)	32.2% (154)

Note: Because of non-response on several questions, not all row frequencies sum to 485.

Respondents were also asked about reasons for voice calling rather than texting. Table 6 shows that nearly 87 percent of students (421) said that some types of communication were better mediated through voice calls. Respondents also stated that making a voice call was influenced by whether the recipient texted or not, with 72 percent of students (348) identifying this reason as important. Hearing the voice of the recipient was also important to some respondents; close to 70 percent of respondents (337) identified wanting to hear the recipient's voice as important for making a voice call. The difficulty in composing text messages did not

appear a significant reason for voice calling. In fact, 65 percent of students (310) did not consider the difficulty of composing texts as a reason to switch to voice calls.

Table 6 Reasons for Calling Rather Than Texting

	Very important (frequency)	Somewhat important (frequency)	Not very important (frequency)	Not important at all (frequency)
Texting takes too much effort	10.9% (52)	24.3% (116)	26.8% (128)	38.1% (182)
Some communication is better done through talking	53.5% (259)	33.5% (162)	8.1% (39)	5.0% (24)
Recipient does not text	32.0% (155)	39.9% (193)	17.4% (84)	10.7% (52)
Wants to hear recipient's voice	32.6% (157)	37.3% (180)	22.0% (106)	8.1% (39)

Note: Because of non-response on several questions, not all row frequencies sum to 485.

Student Preferences for Texting and Talking

Responses from the survey indicated that texting appeared to be more popular with students than voice calls. As shown in table 7, close to 44 percent of students (210) preferred texting, while only 13 percent (64) preferred talking. Nevertheless, 43 percent of students (207) preferred neither texting nor talking, using both mediums for different situations. Even though texting was more popular than voice calling among some of the respondents, it has not replaced talking as a medium of communication.

Table 7 Respondent Preferences for Texting or Voice Calls

Prefers texting (frequency)	43.7% (210)
Prefers talking (frequency)	13.3% (64)
Has no preference (frequency)	43.0% (207)

Note: Because of non-response, the column frequencies do not sum to 485

Using the Cell Phone to Avoid Others

Table 8 shows that using the cell phone to avoid others also appeared common among respondents. Seventy-one percent of respondents (346) said they have pretended to talk on their cell phones to avoid others. Thus, for some respondents, a latent function of the cell phone is as a tool to avoid others during certain situations.

Table 8 Using the Cell Phone to Avoid Others

	Yes (frequency)	No (frequency)
Have you ever pretended to talk on your cell phone to avoid someone?	71.3% (346)	28.7% (139)

Note: Because of non-response on this question, the row frequencies do not sum to 485

Effects of Sex, Age, and Extroversion on Frequency

To test the effects of age, sex, and extroversion on texting frequency, a multinomial logistic regression model was used. Table 9 and table 10 below reveal the results of the multinomial logistic regression on the dependent variable of texting frequency. First, sex did not appear to be a significant predictor of texting in either the weighted or non-weighted model. This finding contradicted previous research. For instance, Lenhart et al. (2010), Crystal (2008), and Faulkner and Culwin (2005) all found that females text more than males text. Thus, the hypothesis for sex (H1a) was not supported. Extroversion, however, was significant for the category 100 to 199 messages. The coefficient of .096 for both the non-weighted and weighted models indicated that, as extroversion increased, the more likely the respondent was to text between 100 and 199 messages rather than 0 to 99 messages, with the other predictors being held constant. The exponentiated coefficient indicated that the partial odds ratio of texting 100 to 199 messages versus 0 to 99 messages increased by 10 percent for every one unit increase in the extroversion scale, controlling for the other variables in the model. Interestingly, extroversion

did not retain its significance for the category of texting 200 or more messages per day, although for the weighted model it came somewhat close to significant at the $p < .05$. The hypothesis that extroverts send more texts (H3a) thus received partial support.

Age proved to be the most significant predictor of texting frequency for both the weighted and non-weighted models. The coefficients for the models revealed that as age increased the odds of texting decreased. The exponentiated coefficients for both models provide a more illustrative interpretation of how age attenuates texting frequency. For the weighted model, a one year increase in age decreased the odds of texting 100 to 199 messages daily by 14.1 percent, controlling for the other variables in the model; stated differently, with a one year decrease in age, the odds ratio of texting 100 to 199 as opposed to 0 to 99 messages per day increased by 16 percent (—). For the category of 200 or more messages, age remained significant. A one year increase in age lowered the odds of texting 200 or more messages per day as opposed to 0 to 99 messages per day by 20 percent, holding other variables in the model constant. The interpretations for the non-weighted model indicated that a one year increase in age decreased the odds of texting 100 to 199 messages by 13 percent, controlling for the other variables. Again, older respondents were even less likely to send 200 or more text messages per day as opposed to 0 to 99 messages, with the odds decreasing by 23 percent for each year of age, holding the other variables constant. These findings thus supported the hypothesis of the effect of age on texting frequency (H2a). Despite these findings, the low pseudo R² values, which calculate the reduction in the log-likelihood statistic, indicated that these predictors did not substantially reduce errors in prediction of the dependent variable. In the weighted model, the Cox and Snell value of nearly 10 percent and the Nagalkerke of roughly 12 percent revealed that the introduction of the three predictor variables did not improve the model fit of the observed

log-odds ratios to a great extent. The non-weighted model had nearly identical pseudo R2 values, indicting the same need for further explanation.

Table 9 Multinomial Logistic Regression Model of Average Number of Daily Texts on Predictors (Weighted Data), N= 462

100-199 messages per day vs. 0-99 texts per day				
Variables	B (SE)	Exp(B)	95% CI Lower	95% CI Upper
Constant	1.067 (1.031)			
Sex	-.212 (.229)	.809	.517	1.267
Age	-.151*** (.041)	.859	.793	.932
Extrovert	.096* (.040)	1.101	1.018	1.190
200 or more messages per day vs. 0-99 texts per day				
Variables	B (SE)	Exp(B)	95% CI Lower	95% CI Upper
Constant	1.927 (1.537)			
Sex	-.405 (.293)	.667	.376	1.184
Age	-.219*** (.067)	.803	.704	.916
Extrovert	.092 (.050)	1.096	.993	1.209

R²=.098 (Cox & Snell), .117 (Nagalkerke). Model $\chi^2(6)=47.996, p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 10 Multinomial Logistic Regression Model of Average Number of Daily Texts on Predictors (Non-Weighted) Data, N= 462

100-199 messages per day vs. 0-99 texts per day				
Variables	B (SE)	Exp(B)	95% CI Lower	95% CI Upper
Constant	.838 (.992)			
Sex	-.211 (.266)	.810	.481	1.363
Age	-.140*** (.039)	.869	.805	.938
Extrovert	.096* (.040)	1.101	1.019	1.190
200 or more messages per day vs. 0-99 texts per day				
Variables	B (SE)	Exp(B)	95% CI Lower	95% CI Upper
Constant	2.965 (1.606)			
Sex	-.414 (.346)	.661	.335	1.303
Age	-.259*** (.072)	.772	.670	.889
Extrovert	.073 (.050)	1.076	.976	1.186
R ² =.097 (Cox & Snell), .115 (Nagalkerke). Model $\chi^2(6)=47.288$ $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$				

Effects of Sex, Age, and Extroversion on Preference

Sex, age, and extroversion were also assessed for their effects on preferences for texting or talking. Again, multinomial logistic regression was used to test these variables. The results are shown in tables 11 and 12. Both the weighted and non-weighted models revealed the importance

of sex and age as predictors for preferring texting to talking; however, extroversion did not approach significance in either of the models. The models highlighted that males preferred voice calls to texting. For instance, the exponentiated coefficients for sex in the weighted and non-weighted models showed that the odds of women preferring texting to talking were more than three times higher than those of men, holding the other variables in the model constant. Put another way, the odds of men preferring texting over talking were less than one-third of the odds that women will prefer texting, controlling for other variables in the models. For the odds of no preference, sex did not reach statistical significance, although the odds ratios indicated that the odds of men having no preference versus preferring talking were 36.2 percent and 38.2 percent lower than the odds for women. These models supported the hypothesis that females preferred texting more than males preferred texting (H1b).

The models showed that older respondents seemed to prefer voice calls to texting. The weighted model revealed that a one year increase in age decreased the odds of preferring texting to voice calls by 11 percent, holding other variables constant. The non-weighted model revealed that a one year increase in age decreased the odds of preferring texting to talking by 13 percent, controlling for other variables in the model. Simply stated, older respondents appeared more likely to prefer voice calls to text messaging. For the contrast of “has no preference” versus “preferring talking,” age was also significant, revealing the importance of voice calls for older respondents. For the weighted model, a one year increase in age decreased the odds of having no preference in comparison to preferring voice calls by 7.3 percent. In the non-weighted model, a one year increase in age decreased the odds of having no preference as opposed to preferring voice calls by 9.1 percent. In simpler terms, older students were more likely to respond that they preferred talking rather than to indicate not having a preference. The data thus supported (H2b).

Again, the models did not show much of an improvement in predicting the observed probabilities. The Cox and Snell values were .094 for the weighted model and .90 for the non-weighted model. The Nagelkerke for the weighted model was .108, while for the non-weighted model it was .105.

Table 11 Multinomial Logistic Regression Model of Preferences for Texting or Talking on Predictors (Weighted Data), N=461

Prefers texting vs. reference category of preferring talking				
Variables	B (SE)	Exp(B)	95% CI Lower	95% CI Upper
Constant	3.308 (1.001)			
Sex	-1.277*** (.302)	.279	.154	.504
Age	-.111*** (.030)	.894	.844	.948
Extrovert	.050 (.050)	1.051	.953	1.158
Has no preference vs. reference category of preferring talking				
Variables	B (SE)	Exp(B)	95% CI Lower	95% CI Upper
Constant	2.262 (.928)			
Sex	-.449 (.289)	.638	.362	1.125
Age	-.076** (.025)	.927	.883	.973
Extrovert	.057 (.048)	1.058	.963	1.162

R²=.094 (Cox & Snell), .108 (Nagalkerke). Model $\chi^2(6)=45.638$, $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 12 Multinomial Logistic Regression Model of Preferences for Texting or Talking on Predictors (Non-Weighted Data), N= 461

Prefers texting vs. reference category of preferring talking				
Variables	B (SE)	Exp(B)	95% CI Lower	95% CI Upper
Constant	4.441 (1.040)			
Sex	-1.313*** (.342)	.269	.138	.526
Age	-.140*** (.031)	.869	.818	.923
Extrovert	.013 (.053)	1.013	.914	1.123
Has no preference vs. reference category of preferring talking				
Variables	B (SE)	Exp(B)	95% CI Lower	95% CI Upper
Constant	3.182 (.979)			
Sex	-.482 (.318)	.618	.331	1.153
Age	-.095*** (.026)	.909	.863	.957
Extrovert	.022 (.052)	1.022	.924	1.130

$R^2=.090$ (Cox & Snell), .105 (Nagalkerke). Model $\chi^2(6)=43.704$, $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$.

Effects of Sex, Age, and Extroversion on Avoidance

Pretending to talk on a cell phone was also examined in this study. Using binary logistic regression to test the variables, both models revealed that sex was a significant predictor. Age,

however, was significant only in the non-weighted model. Extroversion did not reach significance in either model. In both models, females were twice as likely as males to pretend to talk on their cell phones to avoid someone. Thus, H1c was supported by the models. As previously mentioned, only in the non-weighted model did age prove significant. For this model, older respondents were less likely to feign talking on their cell phones to avoid others. The exponentiated coefficient indicated that a one year increase in age decreased the odds of pretending to talk on a cell phone by five percent. Thus, younger rather than older respondents appeared to use their cell phones as tools to avoid others. The data thus provided support for H2c. As in previous models, the two pseudo R² were very small, showing that the predictors did not greatly improve the fit of the model.

Table 13 Binary Logistic Regression Model of the Dependent Variable of Pretending to Talk on a Cell Phone on Predictors (Weighted Data), N= 465

Variables	B (SE)	Exp(B)	95% CI Lower	95% CI Upper
Constant	1.346 (.699)			
Sex	-.885*** (.204)	.413	.277	.616
Age	-.031 (.020)	.969	.931	1.009
Extrovert	.036 (.035)	1.037	.969	1.110

R²=.008 (Hosmer & Lemeshow), .051 (Cox & Snell), .071 (Nagalkerke). Model $\chi^2(3)=24.384$, $p < .001$.
 * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 14 Binary Logistic Regression Model of the Dependent Variable of Pretending to Talk on a Cell Phone on Predictors (Non-Weighted Data), N= 465

Variables	B (SE)	Exp(B)	95% CI Lower	95% CI Upper
Constant	1.544 (.704)			
Sex	-.880*** (.231)	.415	.264	.652
Age	-.051* (.021)	.950	.911	.991
Extrovert	.053 (.036)	1.054	.982	1.131

R²=.233 (Hosmer & Lemeshow), .050(Cox & Snell), .072 (Nagalkerke). Model $\chi^2(3)=24.029, p < .001$.
 * $p < .05$, ** $p < .01$, *** $p < .001$.

CHAPTER 4

CONCLUSION

Discussion

This study revealed many interesting findings. First and foremost, the cell phone has become a part of everyday life for an overwhelming majority of undergraduates: 99 percent of the sample reported using cell phones. Respondents texted friends more than any other group, while parents received the most voice calls from respondents. As Ling (2004) pointed out, texting is often used to plan meetings with friends; consequently, students likely texted friends to make arrangements. Although the survey did not ask respondents about their living arrangements, many in the sample may live on campus. Because some students who live on campus may not see their parents regularly, they may choose to call rather than text their parents. Hearing the voice of their parents over a call is also more intimate than seeing words on a small phone screen, giving respondents a closer connection to their parents than a text message. Distance from a recipient may thus prompt the use of voice calling rather than text messaging; in essence, those the respondent sees on a regular basis, such as friends, receive more texts, while those the respondent does not see on a regular basis, receive calls. Around 70 percent of undergraduates rated wanting to hear the other persons voice as either somewhat important or very important. Thus, respondents who do not regularly see someone in their close circle most likely want to call the person rather than text. Nevertheless, future research should examine this topic in more detail than the present study. Particularly, researchers need to examine how propinquity may influence the use of texting and voice calling.

The study also highlighted the pragmatic nature of texting. For example, when asked to rate the importance of various reasons for texting rather than talking, respondents rated “not a

good time for the caller to talk” and “not a good time for the recipient to talk” as being significant reasons for texting. Texting has thus given people a way to overcome limitations of traditional voice calls. When the caller or recipient cannot engage in a call, he or she can use texting instead. Respondents also rated keeping the message short as a reason for texting rather than calling. Thus, if respondents do not wish to engage in a lengthy conversation with someone, he or she may text to convey a short message without the hassle. Undergraduates also cited the fact that some messages were better conveyed through text as being important. The study did not identify which types of messages respondents considered better for texting; however, short messages, such as those sent to significant others or friends, would be included. Taylor and Harper (2003) noted that couples often texted each other short messages such as “good night” and “good morning” rather than call. Nonetheless, future research should explore in more detail reasons for choosing texting over talking.

Motivations for voice calls also revealed a kind of pragmatism. A majority of respondents cited that certain communication was better done through calling rather than texting. Again, this study did not examine the particular types of communications amenable to voice calls. However, several respondents in the survey answered the open-ended question about motivations for calling rather than texting. Respondents who answered the question stated that longer messages are simply better taken care of through a voice call rather than a text message. Some respondents also pointed out that they cannot tell how the recipient feels during a texting exchange. Consequently, some respondents may choose to call so they can hear how recipients handle certain types of information. Moreover, some respondents cited the effort it takes to send a text as being a reason for voice calling. These types of responses highlighted a pragmatic motivation for voice calling. However, researchers should explore this area in more depth. As

stated previously, distance may play a role in a person's decision to make a call rather than text. Time may affect a person's decision as well. For instance, if a person has not seen a friend or loved one for a long period of time, he or she may choose to call rather than text, desiring to hear the voice of the person. Time and distance, although not the only variables, deserve further examination.

The models predicting texting frequency showed that age appeared to be the strongest predictor. This finding raises the question as to why age is such a strong predictor for texting frequency. Lenhart et al. (2010) highlighted the surging popularity of texting for teens. It may be the case that younger users simply have a comfort level with the technology that older users do not have. The trend of younger users texting more than older users will most likely change as the young mature. Texting will most likely continue to be an integral part of their lives. As a consequence, age may not be a significant predictor in future studies as younger users become adults and continue their texting behaviors. However, it is possible that texting may disappear as a medium of communication as new technologies emerge, thus negating any of these propositions.

Although Lenhart et al. (2010) found that females were more likely to text than males, this study of undergraduate students did not confirm this finding. In fact, in both models of texting frequency, sex did not reach significance. However, prior research has mainly focused on younger teens. When they reach college age, differences in texting may decrease between males and females. For example, Baron and Ling (2007) did not find significant differences in texting between male and female students. In fact, their study revealed males text slightly more than females. Further study needs to be done examining possible differences for males and females of various ages. The lack of significance for the extroversion variable may be attributable to the use

of only a small part of the NEO-FFI scale of extroversion. Nevertheless, in the first two models, extroverted respondents were more likely to text between 100 and 199 messages versus sending 0 to 99 messages, indicating that extroversion did play some role. A future study should incorporate the entire extroversion scale of the NEO-FFI. The addition of these questions could add to the predictive power of this variable. If possible, researchers should also include other types of personality measures, such as anxiety, into their studies of texting. Although these questions would add significantly to the length of a questionnaire, their addition would provide valuable insight into how personality factors affect the use of text messaging.

The preference for texting or talking variable provided interesting results. First, although sex did not appear to be a powerful predictor of texting frequency, it did have an impact in terms of preference. In this sample, females were more likely to prefer texting and males more likely to prefer talking. Why females prefer texting is difficult to discern. It may be that females network differently and thus choose to text in order to keep up with a large network of friends. It may also be that females are more proficient than males in using the cell phone for texting. These suppositions warrant exploration in future studies, although they do not exhaust the possibilities for reasons why males and females differ in preferences for texting or talking. Age again proved to be a significant predictor, with older respondents more likely to prefer talking versus texting. Again, this finding is most likely attributable to the fact that some older respondents do not have the same proficiency with texting as younger users. However, this trend may change as younger users become more mature.

This study, along with Baron and Ling (2010), examined the use of the cell phone to avoid others. Sex proved to be the strongest predictor of using a cell phone to avoid others, with females being much more likely than males to pretend talking on their phones. As Baron and

Ling (2007) pointed out, some women pretend to talk on their phones as a form of protection while walking alone. Protection thus appears to be a primary reason why females engage in this behavior. Age was slightly significant as a predictor, with older respondents being less likely to pretend talking on their cell phones. Again, it may be that younger users have more comfort with the technology and using it in such fashion, while older users may not think to use it in this way. Younger users may also be out more in situations where they feel threatened or wish to avoid someone, while an older user may not encounter these situations. These explanations, however, are limited, resulting in a need for research into why people, especially women and younger users, use the cell phone to avoid others.

The low pseudo R² values for the logistic regression models reveal the need for inclusion of other variables. Age, sex, and extroversion did not have large effects on the dependent variables in this sample. Future research should include other variables to add to these models. For example, a variable or variables that examine a person's social network may help explain a great deal of variation in text messaging. A person with many friends may be more likely to send a lot of texts than someone with a small group. Social networks do not include friends only, but they may also include contacts from work or other places. For instance, if a person coaches a little league team, he or she may receive many texts from parents inquiring about games and practices. Consequently, this person would have to send texts to all the parents. Size and type of social networks may thus explain a lot of variation in texting frequency. Examining the types of jobs respondents hold may also be worthwhile. People working at jobs that do not allow them to be near their phones, such as factory workers, are limited in the amount of texts they can send. By contrast, a person working at a job with a lot of freedom may have access to their phones and be able to send a large quantity of texts during their workday. Thus, future researchers may want

to incorporate this variable into a future study of texting. To conclude, this study showed the need for the inclusion of more variables in future models that examine texting frequency, preferences for texting or talking, and use of the cell phone to avoid others.

Limitations

The use of a convenience sample was a major limitation of the current study. Consequently, it was not possible to generalize the findings to the general population. Moreover, respondents sometimes provide untruthful answers to survey questions. Respondents may do this because they feel embarrassed or for other personal reasons. As a result, some information in this study may reflect this lack of truthfulness. The study would have been more complete had focus groups been used in conjunction with questionnaires. Focus groups provide researchers the opportunity to gain a more in-depth knowledge about subjects than questionnaires alone. Breaking up groups into various ages and dividing them by sex would have greatly enhanced the results of this study. Hence, the study would have benefited by using student focus groups. Each of these deficiencies can be easily corrected by future researchers. Nevertheless, even with these limitations, the current study adds to the body of literature on cell phone behavior and provides valuable direction for future research.

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APPENDIX

LaBowe Cell Phone Questionnaire

Dear Participant: My name is Chris LaBowe, and I am a graduate student at East Tennessee State University. I am working on my master's degree in Sociology. In order to finish my studies, I need to complete a research project. The name of my research study is Texting versus Talking as Human Social Interaction: A Sociological Inquiry. The purpose of this study is to examine how text messaging is changing social interaction. I would like to give a brief survey questionnaire to students at East Tennessee State University. It should only take 30 minutes to an hour to complete. You will be asked questions about how much you text, whom you text, and your reasons for text messaging. Participation in this research project is completely voluntary. If you do not want to fill out the survey, it will not affect you in any way.

1. Sex: ☐Female ☐Male

2. What year were you born? _____

3. Race: ☐White/Non Hispanic ☐African American ☐African ☐Hispanic
☐Native American ☐Asian/ Pacific Islander ☐Other

4. Class Rank: ☐Freshman ☐Sophomore ☐Junior ☐Senior ☐Other

5. Relationship Status: ☐Single ☐Married ☐Divorced ☐In a relationship

6. Parental Status: ☐Parent ☐No (If no, skip to question 8)

7. How many children do you have _____.

8. Please read each of the following statements carefully and rate your level of agreement with each using the following scale (choose one per statement):

1 = Strongly Disagree, 2 = Somewhat Disagree, 3 = Neutral, 4 = Somewhat Agree, and 5 = Strongly Agree

I like to have a lot of people around me	1	2	3	4	5
I really enjoy talking to people	1	2	3	4	5
I usually prefer to do things alone	1	2	3	4	5
I would rather go my own way than be a leader of others	1	2	3	4	5

9. Do you use a cell phone? ☐Yes ☐No (If no, skip to question 25)

10. Do you have a landline phone? ☐Yes ☐No

11. Is your cell phone the device you use for the majority of your communication?

___Yes ___No

12. Do you generally keep your cell phone turned on?

___Yes ___No

13. Do you generally keep your cell phone within reach?

___Yes ___No

14. Do you have text messaging on your phone?

___Yes ___No (If you answer no, skip to question 20)

15. Do you use your phone for text messaging?

___Yes ___No

16. Do you have unlimited text messaging on your cell phone?

___Yes ___No

17. On average, how many text messages do you send a day?

___0-49 ___50-99 ___100-149 ___150-199 ___200 or more

18. On average, how many text messages do you receive a day?

___0-49 ___50-99 ___100-149 ___150-199 ___200 or more

19. When using your cell phone, about how often do you text the following people (pick only one response for each category).

	<u>Text very frequently</u>	<u>Text frequently</u>	<u>Occasionally text</u>	<u>Sometimes text</u>	<u>Never text</u>
Parents	1	2	3	4	5
Children	1	2	3	4	5
Siblings	1	2	3	4	5
Friends	1	2	3	4	5
Other	1	2	3	4	5

20. When using your phone, about how often do you voice call the following people (pick only one response for each category)

	<u>Call very frequently</u>	<u>Call frequently</u>	<u>Occasionally call</u>	<u>Sometimes call</u>	<u>Never call</u>
Parents	1	2	3	4	5
Children	1	2	3	4	5
Friends	1	2	3	4	5
Siblings	1	2	3	4	5
Other	1	2	3	4	5

If you do not have text messaging on your cell phone skip questions 21, 22, and 23.

21. Overall, do you prefer text messaging to voice calls?

☐ Yes, I prefer texting ☐ No, I prefer voice calls ☐ I like both equally
☐ It depends on what I want to do

22. When you decide to send a text message to a friend on your cell phone, how important (in general) are the following reasons for sending a text message rather than calling?

It's not a good time for me to talk.

☐ very important ☐ somewhat important ☐ not very important ☐ not important at all

It's not a good time for the recipient to talk.

☐ very important ☐ somewhat important ☐ not very important ☐ not important at all

I want to make my message short, and talking takes too long.

☐ very important ☐ somewhat important ☐ not very important ☐ not important at all

Some communication is better done by sending a text message rather than talking.

☐ very important ☐ somewhat important ☐ not very important ☐ not important at all

Sending a text message is cheaper.

☐ very important ☐ somewhat important ☐ not very important ☐ not important at all

I want to keep some distance from the person I'm communicating with.

☐ very important ☐ somewhat important ☐ not very important ☐ not important at all

23. When you decide to call a friend on your cell phone, how important (in general) are the following reasons for calling rather than sending a text message?

Sending a text message takes too much effort.

☐ very important ☐ somewhat important ☐ not very important ☐ not important at all

Some communication is better done by talking rather than sending a text message.

☐ very important ☐ somewhat important ☐ not very important ☐ not important at all

Some of the people I want to contact don't do texting.

☐ very important ☐ somewhat important ☐ not very important ☐ not important at all

I want to hear the voice of the person I'm communicating with.

☐ very important ☐ somewhat important ☐ not very important ☐ not important at all

Other (please write another reason you may choose to call a friend rather than text).

24. Have you ever pretended to talk on your cell phone to avoid someone?

☐ Yes ☐ No

25. If you do not use a cell phone at all, please briefly explain the reasons why.

Thank you very much for taking the time to complete this survey.

VITA

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